

REMARKS

Claims 1-20 are pending in this application. Attached hereto is a complete listing of all the pending claims. By this Response, claims 1, 5, 10 and 14 have been amended, and are presented with markings to indicate their current amendments.

In paragraphs 1-2 of the Office Action, the Examiner rejects to claims 10-11 as indefinite. Specifically, the Examiner states that "the pulse sampling rate" element of claim 10 lacks antecedent basis. As claim 11 depends from claim 10, it is also rejected. In response, Applicant has amended claim 10 to establish proper antecedent basis for the "pulse sampling rate" element.

The above-described claim amendments have been drafted in response to the indefiniteness rejection. The claim amendments have not been drafted to overcome any prior art.

Rejection Under 35 U.S.C. § 102

In paragraphs 3-4 of the Office Action, the Examiner rejects claims 1-20 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 5,715,236 ("Gilhousen"). As discussed below, Applicant respectfully traverses this rejection.

A. The Law of Anticipation and Enabling Prior Art References

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. M.P.E.P. § 2131. The identical invention must be shown in as complete detail as is contained in the claim. *Id.*

However, Applicant submits that amended independent claims 1, 5 and 14 each have elements that cannot be found, either expressly or inherently, in Gilhousen. Specifically, both claims 1 and 5 have been amended to more clearly define the originally-claimed "pulses" as "ultra-wideband pulses." Similarly, claim 14 has been amended to recite, in part, "ultra-wideband spread spectrum signals." Gilhousen has no teaching or suggestion of ultra-wideband communication technology.

Gilhousen relates to the generation of signal waveforms in a conventional CDMA cellular telephone system. Conventional cellular communication employs continuous sine waves that are transmitted at a specific frequency. Specifically, Gilhousen teaches transmission "in the 850 MHz cellular radio frequency band" (col. 2, lines 15-16). This is because, in the United States, the Federal Communications Commission has limited cellular phone communications to the 800 to 900 MHz band. Within this frequency band, Gilhousen teaches "the waveform utilized in the cellular telephone system should be less than 1.5 MHz in bandwidth" (col. 8, lines 8-9).

Gilhousen then teaches various methods of modulating data onto the 850 MHz carrier frequency. For example, Gilhousen teaches psuedo-random (PN) "sequences that provide orthogonality between the users so that mutual interference will be reduced" (col. 4, lines 35-36). Also, cellular communications are "encoded, interleaved, bi-phase shift key (BPSK) modulated" along with "quadrature phase shift key (QPSK) spreading of the covered symbols" (col. 4, lines 48-51).

Thus, Gilhousen teaches conventional 1.5 MHz bandwidth cellular communication using a 850 MHz carrier frequency with various data modulation techniques.

In contrast, the present invention employs ultra-wideband technology. As stated in the Field of the Invention, the present invention "relates to an ultra wideband receiver." "Ultra wide band (UWB) is a wireless technology for transmitting large amounts of digital data over a wide spectrum of frequency bands with very low power" (page 4, lines 1-3).

As stated in the Summary of the Invention, the present invention "receives and demodulates data transmitted, **without a carrier frequency**, as a series of ultra-short, spread spectrum modulated electromagnetic pulses" (page 6, lines 8-9). In the present invention, data may be "transmitted via impulses having 100 picosecond risetime and 200 picosecond width,

which corresponds to a bandwidth of between about **2.5 GHz and 5 GHz**" (page 15, lines 11-13). (emphasis added)

Thus, the claimed ultra-wideband technology is very different from the conventional cellular technology taught by Gilhousen. UWB (also known as "impulse radio") employs pulses of electromagnetic energy that are emitted at nanosecond or picosecond intervals. Because the excitation pulse is not a modulated waveform, UWB has also been termed "carrier-free" in that no apparent carrier frequency is evident in the radio frequency (RF) spectrum. That is, the UWB pulses are transmitted without modulation onto a sine wave carrier frequency, in contrast with conventional radio frequency technology (i.e., Gilhousen).

In summary, Gilhousen teaches conventional communications using a 850 MHz continuous sine wave carrier frequency, with a 1.5 MHz bandwidth. In contrast, Applicant claims ultra-wideband pulse communications comprising a plurality of discrete pulses that may have a bandwidth of up to 5 GHz.

Clearly, these two technologies are as different as apples and oranges.


Thus, Gilhousen contains no teaching or suggestion of an ultra-wideband technology, and as discussed above, ultra-wideband technology functions completely differently than conventional carrier wave technology. Therefore, the anticipation rejection of independent claims 1, 5 and 14 is respectfully traversed. Specifically, Gilhousen does not teach or suggest all of the claim limitations found in independent claims 1, 5 and 14. Also, because claims 2-4, 6-13 and 15-20 depend from either claim 1, 5 or 14, it is respectfully submitted that the rejection of claims 2-4, 6-13 and 15-20 have been traversed by virtue of their dependency from either claim 1, 5 or 14. M.P.E.P. § 2143.03.

Conclusion

Applicant believes that this Response has addressed all items in the Office Action and now places the application in condition for allowance. Accordingly, favorable reconsideration and allowance of claims 1-20 at an early date is solicited. No fee is believed due with this response. However, the Commissioner is authorized to charge any fee required to our Deposit Account No. 50-2298, in the name of Luce, Forward, Hamilton & Scripps LLP. Should any issues remain unresolved, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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Date


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